

Energy and Sustainability *in* Maryland

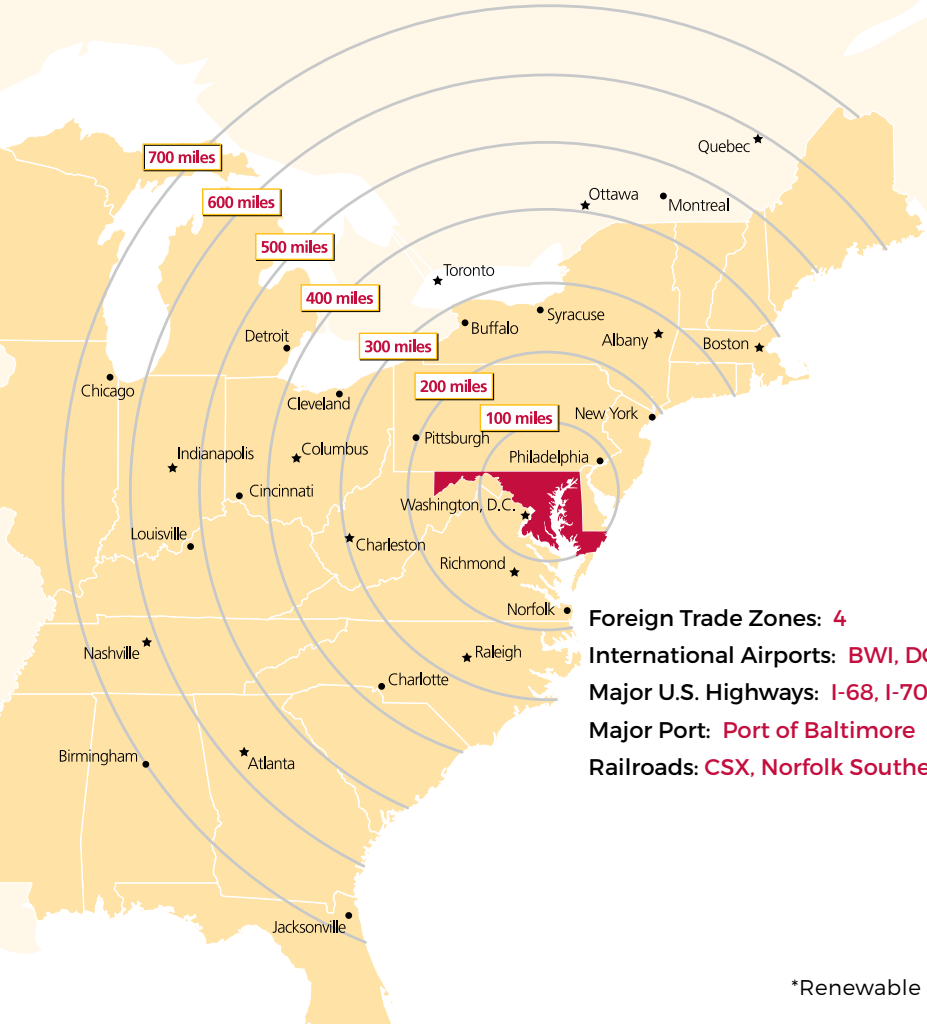
Thriving energy sector with aggressive global opportunity

Alban CAT
SIEMENS
Bithenergy
TimberRock
CovePoint

Whether you are a startup or well-established energy company, choosing the right strategic partner is fundamental for success. The U.S. Chamber of Commerce Foundation **"Enterprising States Innovate" study rates Maryland first in academic research and development intensity,** just one of countless strategic assets that positions Maryland as a global leader in the Energy and Sustainability sector.

Maryland's RPS* requires 20% of the state's energy come from renewable sources by 2022.

Strategic Multi-Modal Location



Foreign Trade Zones: 4
International Airports: BWI, DCA, IAD
Major U.S. Highways: I-68, I-70, I-81, I-83, I-95
Major Port: Port of Baltimore
Railroads: CSX, Norfolk Southern

*Renewable Portfolio Standard

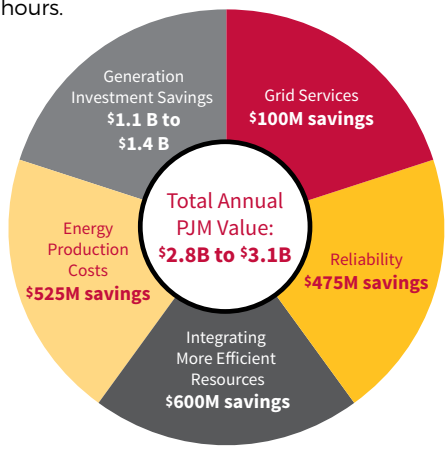
Powerful Energy and Sustainability Resources

Regional Collaboration

Doing business in Maryland affords access to some of the world's most powerful and progressive energy and sustainability resources.

The **Regional Greenhouse Gas Initiative (RGGI)** is the first market-based regulatory program in the United States to reduce greenhouse gas emissions and one of the world's largest carbon-trading programs, generating more than $1.3 billion since its inception in 2009.

The **Pennsylvania New Jersey-Maryland (PJM) Interconnection** is the world's first and North America's largest and most integrated power pool. Through the grid, PJM member utilities share their generating output to avoid costly shortfalls and surpluses. As one of the largest competitive wholesale electricity markets, the PJM has an annual energy usage of 793,679 gigawatt hours.



Maryland's new Greenhouse Gas Emissions target requires a reduction of 40% by 2030—one of the strongest climate goals in the country.

Exceptional Workforce Pipeline

Maryland's Energy and Sustainability workforce pipeline is fueled by a highly educated and diverse workforce.

1st

- in percentage of **professional and technical workers**
- in **doctoral scientists and engineers**
- among the states in **geographers and 2nd in physical scientists**

57 **colleges and universities**

16 **community colleges** continuing education and workforce training

Powerful Energy and Sustainability Resources

Research and Development Leader

Maryland's 350 federal and academic research centers and 32 business incubators and research parks stimulate myriad opportunities for energy and sustainability R&D and technology commercialization.

Maryland Clean Energy Center (MCEC)—As an instrumentality of State, MCEC exists to advance the adoption of clean energy solutions along with energy efficiency products, services and technologies. MCEC facilitates access to affordable capital for energy project financing to reduce energy costs and enable development of the advanced energy economy.

University of Maryland College Park—Research assets offered through the University of Maryland College Park include the Center for Environmental Energy Engineering, the Center for Energetic Concepts Development and the Harry R. Hughes Center for Agro-Ecology, Inc.

University of Maryland Center for Environmental Sciences (UMCES)—Uses science to transform the way society understands and manages the environment. With four locations strategically placed between the mountains and sea, UMCES research laboratories provide scientists direct access to Maryland's diverse natural ecosystems.

University of Maryland Energy Research Center—The University of Maryland Energy Research Center provides a comprehensive balanced energy research program, based on the most efficient use of our natural resources while minimizing environmental impacts and our dependence on imported energy, with faculty expertise across a broad spectrum of energy technology and policy.

University of Maryland Industrial Partnerships Program (MIPS)—Provides funding, partially matched by participating companies, for university-based research projects that help the companies develop new products.

Meet the Cube Game-changing fuel cell technology

Through MIPS, Redox Power Systems, LLC teamed with the University of Maryland Energy Research Center to determine the mechanical strength of the company's solid oxide fuel cells. Redox Cube, a 25 kW, natural gas fueled, stationary power system measuring 35 cubic feet and weighing 1,000 lbs, provides the technology breakthroughs needed to cost-effectively convert natural gas or propane into electricity with high efficiency and low emissions.

Maryland *is* Open *for* Business

SOLAR ENERGY

Baltimore-based Bithenergy designed and constructed a 669kW ground and roof mount solar power station on the Chimes International campus in Baltimore, Maryland. Bithenergy offers services for the development of renewable power generation systems, advanced energy management solutions, energy consulting, and smart grid and energy storage infrastructure build-out. The company is a Maryland Certified Minority Business Enterprise (MBE) and conducts business throughout the world.

Maryland's diverse and talented workforce, exceptional educational institutions, and world-renowned research laboratories are essential to Bithenergy's pursuit of innovative solutions to increase the implementation of renewable energy and utilization of energy management to solve complex challenges. Robert L. Wallace, CEO, Bithenergy

COMBINED HEAT AND POWER

Alban CAT Power Systems, located in Elkridge, Maryland, serving the mid-Atlantic region, provides Total Energy Solutions, including Combined Heating and Power (CHP), and is quickly becoming the turnkey answer for hospitals, including The University of Maryland Medical System-Upper Chesapeake Medical Center (UMMS-UCMC), and other major power customers.

Maryland's forward approach to building a resilient power grid has propelled the marketplace toward improved energy efficiency and overall emissions reductions. We applaud how Maryland has come alongside the private sector to aid in this development. Mike Lewis, Vice President, Alban CAT Power Systems

In 2014, Maryland invested $221 million on solar installations, a 95% increase from the previous year.

Energy and Sustainability Company Showcase

MICROGRID AND ENERGY STORAGE

TimberRock energysolutions

TimberRock Energy Solutions is a Maryland-based energy services provider positioned at the intersection of clean power generation, microgrid power delivery and the electrification of transportation. TimberRock's award-winning hardware and software deliver energy savings, resiliency, control and sustainability – as a service – for residential and commercial buildings.

Deployed at General Motors' newest manufacturing facility in White Marsh, Maryland, the TimberRock microgrid combines solar power, advanced energy storage and electric vehicle charging to deliver clean energy and create a more efficient electrical grid.

TimberRock is proud to be part of Maryland's dynamic energy sector and values the Department of Commerce's work facilitating an environment where energy companies—larger and small—can thrive. Brent Hollenbeck, Founder and CEO, TimberRock Energy Solutions

ENERGY SERVICE COMPANY

Building Technologies

SIEMENS

With three locations in Maryland and over 500 employees within the Building Technologies Division, Siemens is a leading provider of automation technologies and services for commercial, industrial and public buildings and infrastructures across their entire lifecycle.

The National Park Service awarded Siemens a $29 million contract to implement energy and water conservation measures in 13 parks including six Maryland locations: Antietam National Battlefield, Catoctin Mountain Park, Harpers Ferry National Historical Park, Monocacy National Battlefield, Chesapeake & Ohio Canal National Park and National Capital Parks East. The project will allow NPS to make significant reductions in Greenhouse Gas emissions, water and energy consumption and deferred maintenance backlogs, reducing yearly energy usage by nearly 20,000 Mbtus.

Siemens is proud to be a technology partner on projects that will help secure Maryland's energy future—from energy management systems, to energy efficiency projects, to more efficient power generation. We will continue to work with the Department of Commerce as we advance initiatives that move Maryland forward. Alison Taylor, Vice President, Sustainability-Americas, DC City Executive, Siemens

Maryland ranks 2nd among the states in the square footage of LEED-certified commercial and institutional green buildings per capita for 2015.

UTILITY SCALE INFRASTRUCTURE

Siemens is the technology partner for the PSEG Keys Energy Center, LLC, – a new 735 MW natural-gas-fired, combined cycle electricity generating plant to be built in Brandywine, Maryland. Siemens will provide gas turbines, steam turbines and generators. The project, slated to be operational in 2018, has a generating capacity to power 500,000 homes in Prince George's and surrounding counties and is estimated to spur $875 million investment to the local and regional economy.

ENERGY DISTRIBUTION AND EXPORTS

COVEPOINT
LNG EXPANSION

Dominion Cove Point, Maryland's liquefied natural gas (LNG) export facility in Lusby, Maryland is expanding their facilities for gas liquefactions and exportation. The project will spur direct, indirect and induced business and job creation, including up to 3,000 on-site construction positions. It is estimated the project has the potential to increase state exports by $5 billion a year.

With the purchase of the Patuxent Business Park in Lusby, Dominion is constructing the largest economic development project ever seen in the state of Maryland, and we congratulate and thank the company for their continued investment in our community. Evan Slaughenhoupt Jr., President, Calvert County Board of County Commissioners

Maryland invested over $91 million within the energy sector in the form of grants, loans and rebates in 2015 and allocated over $81 million for 2016.

Government and Business Support

Maryland Small Business Development Financing Authority (MSBDFA)—Assists small businesses that are unable to qualify for business financing through normal financing channels, including businesses owned by economically and socially disadvantaged entrepreneurs.

Maryland Technology Development Corporation (TEDCo)—Facilitates technology transfer from academic and federal labs into the private sector with seed funding, technical assistance and entrepreneurial support programs.

Maryland Venture Fund (MVF)—State funded seed and early-stage equity fund.

Enterprise Zone Tax Credit—Real property and state income tax credits for businesses locating in zones making capital investments and creating new jobs.

Research and Development Tax Credit—Credit for R&D expenses for certified businesses.

Cellulosic Ethanol Technology R&D Tax Credit—State income tax credits for businesses that incur qualified cellulosic ethanol technology research and development expenses in Maryland.

Maryland Energy Administration (MEA)—MEA helps Maryland residents, businesses, non-profits, and local governments implement energy efficiency upgrades and install renewable energy. MEA also manages grants, loans, rebates, and tax incentives designed to help attain Maryland's goals in energy reduction, renewable energy, climate action, and green jobs.

Maryland
DEPARTMENT OF COMMERCE

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Larry Hogan, Governor | Boyd Rutherford, Lt. Governor

For more information about the Energy and Sustainability Sector in Maryland visit commerce.maryland.gov or contact:

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